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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,107	11/07/2001	Peter M. Gulvin	109180	4859

27074 7590 01/14/2004

OLIFF & BERRIDGE, PLC.
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
HOGANS, DAVID L	
ART UNIT	**PAPER NUMBER**
2813	

DATE MAILED: 01/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

BURNS, DOANE, SWECKER & MATHIS, L.L.P.
RECEIVED
JAN 15 2004
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(4) A claim being canceled must be listed in the claim listing with the status identifier "canceled"; the text of the claim must not be presented. Providing an instruction to cancel is optional.
(5) Any claims added by amendment must be presented in the claim listing with the status identifier "(new)"; the text of the claim must not be underlined.
(6) All of the claims in the claim listing must be presented in ascending numerical order. Consecutive canceled, or not entered, claims may be aggregated into one statement (*e.g.*, Claims 1 – 5 (canceled)).

Example of listing of claims (use of the word "claim" before the claim number is optional):

Claims 1-5 (canceled)

Claim 6 (previously presented): A bucket with a handle.

Claim 7 (withdrawn): A handle comprising an elongated wire.

Claim 8 (withdrawn): The handle of claim 7 further comprising a plastic grip.

Claim 9 (currently amended): A bucket with a ~~green~~ blue handle.

Claim 10 (original): The bucket of claim 9 wherein the handle is made of wood.

Claim 11 (canceled)

Claim 12 (not entered)

Claim 13 (new): A bucket with plastic sides and bottom.

B) Amendments to the specification:
Amendments to the specification, including the abstract, must be made by presenting a replacement paragraph or section or abstract marked up to show changes made relative to the immediate prior version. An accompanying clean version is not required and should not be presented. Newly added paragraphs or sections, including a new abstract (instead of a replacement abstract), must not be underlined. A replacement or new abstract must be submitted on a separate sheet, 37 CFR 1.72. If a substitute specification is being submitted to incorporate extensive amendments, both a clean version (which will be entered) and a marked up version must be submitted as per 37 CFR 1.125.

The changes in any replacement paragraph or section, or substitute specification must be shown by underlining (for added matter) or strikethrough (for deleted matter) with 2 exceptions: (1) for ***deletion of five characters or fewer, double brackets may be used (e.g., [[eroor]]); and (2) if strikethrough cannot be easily perceived (e.g., deletion of the number "4" or certain punctuation marks), double brackets must be used (e.g., [[4]]). As an alternative to using double brackets, however, extra portions of text may be included before and after text being deleted, all in strikethrough, followed by including and underlining the extra text with the desired change*** *(e.g., ~~number 4 as~~ number 14 as)*

C) Amendments to drawing figures:
Drawing changes must be made by presenting replacement figures which incorporate the desired changes and which comply with 37 CFR 1.84. An explanation of the changes made must be presented either in the drawing amendments, or remarks, section of the amendment, ***and may be accompanied by a marked-up copy of one or more of the figures being amended, with annotations.*** Any replacement drawing sheet must ***be identified in the top margin as "Replacement Sheet"*** and include all of the figures appearing on the immediate prior version of the sheet, even though only one figure may be amended. ***Any marked-up (annotated) copy showing changes must be labeled "Annotated Marked-up Drawings" and accompany the replacement sheet in the amendment (e.g., as an appendix).*** The figure or figure number of the amended drawing(s) must not be labeled as "amended." If the changes to the drawing figure(s) are not accepted by the examiner, applicant will be notified of any required corrective action in the next Office action. No further drawing submission will be required, unless applicant is notified.

Questions regarding the submission of amendments pursuant to the revised practice set forth in this flyer should be directed to: Elizabeth Dougherty or Gena Jones, Legal Advisors, or Joe Narcavage, Senior Special Projects Examiner, Office of Patent Legal Administration, by e-mail to patentpractice@uspto.gov or by phone at (703) 305-1616.

REVISED AMENDMENT PRACTICE: 37 CFR 1.121 CHANGED COMPLIANCE IS MANDATORY - Effective Date: July 30, 2003

ll amendments filed on or after the effective date noted above must comply with revised 37 CFR 1.121. See Final ule: **Changes To Implement Electronic Maintenance of Official Patent Application Records** (68 *Fed. Reg.* 3611 (June 30, 2003), posted on the Office's website at: http://www.uspto.gov/web/patents/ifw/ ith related information. The amendment practice set forth in revised 37 CFR 1.121, and described below, replaces e voluntary revised amendment format available to applicants since February 2003. **NOTE: STRICT OMPLIANCE WITH THE REVISED 37 CFR 1.121 IS REQUIRED AS OF THE EFFECTIVE DATE (July 3, 2003).** The Office will notify applicants of amendments that are not accepted because they do not comply with evised 37 CFR 1.121 via a Notice of Non-Compliant Amendment. See MPEP 714.03 (Rev. 1, Feb. 2003). The non-ompliant section(s) will have to be corrected and the entire corrected section(s) resubmitted within a set period.

old underlined italic font has been used below to highlight the major differences between the revised 37 CFR .121 and the voluntary revised amendment format that applicants could use since February, 2003.
lote: The amendment practice for **reissues** and **reexamination proceedings**, except for drawings, has not changed.

REVISED AMENDMENT PRACTICE

. Begin each section of an amendment document on a separate sheet:
ach section of an amendment document (*e.g.*, Specification Amendments, Claim Amendments, Drawing mendments, and Remarks) must begin on a separate sheet. Starting each separate section on a new page will acilitate the process of separately indexing and scanning each section of an amendment document for placement in an nage file wrapper.

I. Two versi ns of amended part(s) no longer required:
7 CFR 1.121 has been revised to no longer require two versions (a clean version and a marked up version) of ach replacement paragraph or section, or amended claim. Note, however, the requirements for a clean ersion and a marked up version for substitute specifications under 37 CFR 1.125 have been retained.

) Amendments to the claims:
ach amendment document that includes a change to an existing claim, cancellation of a claim or submission of a new laim, **must include a complete listing** of all claims in the application. After each claim number in the listing, the tatus must be indicated in a parenthetical expression, and **the text of each pending claim** (with markings to show urrent changes) must be presented. The claims in the listing will replace all prior claims in the application.

(1) The current status of all of the claims in the application, including any previously canceled, not entered or withdrawn claims, must be given in a parenthetical expression following the claim number using only one of the following seven status identifiers: (original), (currently amended), (canceled), (withdrawn), (new), *(previously presented) and (not entered).* The text of all pending claims, *including withdrawn claims,* must be submitted each time any claim is amended. Canceled *and'not entered* claims must be indicated by only the claim number and status, without presenting the text of the claims.

(2) The text of all claims being currently amended must be presented in the claim listing with markings to indicate the changes that have been made relative to the immediate prior version. The changes in any amended claim must be shown by underlining (for added matter) or strikethrough (for deleted matter) with 2 exceptions: (1) for *deletion of five characters or fewer, double brackets may be used (e.g., [[eroor]]); and (2) if strikethrough cannot be easily perceived (e.g., deletion of the number "4" or certain punctuation marks), double brackets must be used (e.g., [[4]]). As an alternative to using double brackets, however, extra portions of text may be included before and after text being deleted, all in strikethrough, followed by including and underlining the extra text with the desired change* (e.g., ~~*number 1 as*~~ *number 14 as).* An accompanying clean version is not required and should not be presented. Only claims of the status "currently amended," and "withdrawn" that are being amended, may include markings.

(3) The text of pending claims not being currently amended, *including withdrawn claims,* must be presented in the claim listing in clean version, *i.e.*, without any markings. Any claim text presented in clean version will constitute an assertion that it has not been changed relative to the immediate prior version except to omit markings that may have been present in the immediate prior version of the claims.

NOTICE OF OFFICE PLAN TO CEASE SUPPLYING COPIES OF CITED U.S. PATENT REFERENCES WITH OFFICE ACTIONS, AND PILOT TO EVALUATE THE ALTERNATIVE OF PROVIDING ELECTRONIC ACCESS TO SUCH U.S. PATENT REFERENCES

Summary

The United States Patent and Trademark Office (Office or USPTO) plans in the near future to: (1) cease mailing copies of U.S. patents and U.S. patent application publications (US patent references) with Office actions except for citations made during the international stage of an international application under the Patent Cooperation Treaty and those made during reexamination proceedings; and (2) provide electronic access to, with convenient downloading capability of, the US patent references cited in an Office action via the Office's private Patent Application Information Retrieval (PAIR) system which has a new feature called "E-Patent Reference." Before ceasing to provide copies of U.S. patent references with Office actions, the Office shall test the feasibility of the E-Patent Reference feature by conducting a two-month pilot project starting with Office actions mailed after December 1, 2003. The Office shall evaluate the pilot project and publish the results in a notice which will be posted on the Office's web site (www.USPTO.gov) and in the Patent Official Gazette (O.G.). In order to use the new E-Patent Reference feature during the pilot period, or when the Office ceases to send copies of U.S. patent references with Office actions, the applicant must: (1) obtain a digital certificate from the Office; (2) obtain a customer number from the Office, and (3) properly associate applications with the customer number. The pilot project does not involve or affect the current Office practice of supplying paper copies of foreign patent documents and non-patent literature with Office actions. Paper copies of references will continue to be provided by the USPTO for searches and written opinions prepared by the USPTO for international applications during the international stage and for reexamination proceedings.

Description of Pilot Project to Provide Electronic Access to Cited U.S. Patent References

On December 1, 2003, the Office will make available a new feature, E-Patent Reference, in the Office's private PAIR system, to allow more convenient downloading of U.S. patents and U.S. patent application publications. The new feature will allow an authorized user of private PAIR to download some or all of the U.S. patents and U.S. patent application publications cited by an examiner on form PTO-892 in Office actions, as well as U.S. patents and U.S. patent application publications submitted by applicants on form PTO/SB08 (1449) as part of an IDS. The retrieval of some or all of the documents may be performed in one downloading step with the documents encoded as Adobe Portable Document format (.pdf) files, which is an improvement over the current page-by-page retrieval capability from other USPTO systems.

Steps to Use the New E-Patent Reference Feature During the Pilot Project and Thereafter

Access to private PAIR is required to utilize E-Patent Reference. If you don't already have access to private PAIR, the Office urges practitioners, and applicants not represented by a practitioner, to take advantage of the transition period to obtain a no-cost USPTO Public Key Infrastructure (PKI) digital certificate, obtain a USPTO customer number, associate all of their pending and new application filings with their customer number, install no-cost software (supplied by the Office) required to access private PAIR and E-Patent Reference feature, and make appropriate arrangements for Internet access. The full instructions for obtaining a PKI digital certificate are available at the Office's Electronic Business Center (EBC) web page at: <http://www.uspto.gov/ebc/downloads.html>. Note that a notarized signature will be required to obtain a digital certificate.

To get a Customer Number, download and complete the Customer Number Request form, PTO-SB125, at: http://www.uspto.gov/web/forms/sb0125.pdf. The completed form can then be transmitted by facsimile to the Electronic Business Center at (703) 308-2840, or mailed to the address on the form. If you are a registered attorney or patent agent, then your registration number must be associated with your customer number. This is accomplished by adding your registration number to the Customer Number Request form. A description of associating a customer number with an application is described at the EBC web page at: http://www.uspto.gov/ebc/registration_pair.html.

The E-Patent Reference feature will be accessed using a new button on the private PAIR screen. Ordinarily all of the cited U.S. patent and U.S. patent application publication references will be available over the Internet using the Office's new E-Patent Reference feature. The size of the references to be downloaded will be displayed by E-Patent Reference so the download time can be estimated. Applicants and registered practitioners can select to download all of the references or any combination of cited references. Selected references will be downloaded as complete documents as Adobe Portable Document Format (.pdf) files. For a limited period of time, the USPTO will include a copy of this notice with Office actions to encourage applicants to use this new feature and, if needed, to take the steps outlined above in order to be able to utilize this new feature during the pilot and thereafter.

During the two-month pilot, the Office will evaluate the stability and capacity of the E-Patent Reference feature to reliably provide electronic access to cited U.S. patent and U.S. patent application publication references. While copies of U.S. patent and U.S. patent application publication references cited by examiners will continue to be mailed with Office actions during the pilot project, applicants are encouraged to use the private PAIR and the E-Patent Reference feature to electronically access and download cited U.S. patent and U.S. patent application publication references so the Office will be able to objectively evaluate its performance. The public is encouraged to submit comments to the Office on the usability and performance of the E-Patent Reference feature during the pilot. Further, during the pilot period registered practitioners, and applicants not represented by a practitioner, are encouraged to experiment with the feature, develop a proficiency in using the feature, and establish new internal processes for using the new access to the cited U.S. patents and U.S. patent application publications to prepare for the anticipated cessation of the current Office practice of supplying copies of such cited

references. The Office plans to continue to provide access to the E-Patent Reference feature during its evaluation of the pilot.

Comments

Comments concerning the E-Patent Reference feature should be in writing and directed to the Electronic Business Center (EBC) at the USPTO by electronic mail at eReference@uspto.gov or by facsimile to (703) 308-2840. Comments will be posted and made available for public inspection. To ensure that comments are considered in the evaluation of the pilot project, comments should be submitted in writing by January 15, 2004.

Comments with respect to specific applications should be sent to the Technology Centers' customer service centers. Comments concerning digital certificates, customer numbers, and associating customer numbers with applications should be sent to the Electronic Business Center (EBC) at the USPTO by facsimile at (703) 308-2840 or by e-mail at EBC@uspto.gov.

Implementation after Pilot

After the pilot, its evaluation, and publication of a subsequent notice as indicated above, the Office expects to implement its plan to cease mailing paper copies of U.S. patent references cited during examination of non provisional applications on or after February 2, 2004; although copies of cited foreign patent documents, as well as non-patent literature, will still be mailed to the applicant until such time as substantially all applications have been scanned into IFW.

For Further Information Contact

Technical information on the operation of the IFW system can be found on the USPTO website at http://www.uspto.gov/web/patents/ifw/index.html. Comments concerning the E-Patent Reference feature and questions concerning the operation of the PAIR system should be directed to the EBC at the USPTO at (866) 217-9197. The EBC may also be contacted by facsimile at (703) 308-2840 or by e-mail at EBC@uspto.gov.

Date: 12/1/03

Nicholas P. Godici

Nicholas P. Godici
Commissioner for Patents

The United States Patent and Trademark Office has changed certain mailing addresses!

Effective May 1, 2003

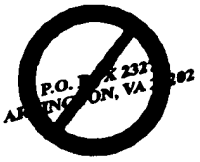
Use the address **provided in this flyer after May 1, 2003** for **any correspondence** with the United States Patent and Trademark Office (USPTO) in patent-related matters **to organizations reporting to the Commissioner for Patents.**

DO NOT USE the Washington DC 20231 and P.O. Box 2327 Arlington, VA 22202 addresses after May 1, 2003 for **any correspondence** with the USPTO even if these old addresses are indicated in the accompanying Office action or Notice or in any other action, notice, material, form, instruction or *other* information.

Correspondence in patent-related matters **to organizations reporting to the Commissioner for Patents** must now be addressed to:



Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450



Special Mail Stop designations to replace Special Box designations

Also effective May 1, 2003, the **USPTO is changing the special Box designations for Patents and Trademarks to corresponding Mail Stop designations** (*e.g.*, "Box 4" will now be "Mail Stop 4").

For further information, see *Correspondence with the United States Patent and Trademark Office*, 68 *Fed. Reg. 14332* (March 25, 2003). A copy of the *Federal Register* notice is available on the USPTO's web site at http://www.uspto.gov/web/menu/current.html#register

A listing of specific USPTO mailing addresses (See Patents – specific) will be available on the USPTO's web site on April 15, 2003 at http://www.uspto.gov/main/contacts.htm

Persons filing correspondence with the Office should check the rules of practice, the Official Gazette, or the Office's Internet Web site (www.uspto.gov) to determine the appropriate address and Mail Stop Designation (if applicable) for all correspondence being delivered to the USPTO via the United States Postal Service (USPS).

Questions regarding the content of this flyer should be directed to the Inventor Assistance Center at (703) 308-4357 or toll-free at 1-800-786-9199.

OIPE JC
JAN 15 2004
PATENT & TRADEMARK OFFICE

Office Action Summary

Application No.	Applicant(s)	
09/986,107	GULVIN ET AL.	
Examiner	**Art Unit**	
David L. Hogans	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 20 November 2003.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 18-22 and 24-32 is/are pending in the application.

4a) Of the above claim(s) 1-17 and 33-36 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 18-22 and 24-31 is/are rejected.

7)☒ Claim(s) 32 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 07 November 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11-07-01.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

This Office Action is in response to the Election Requirement filed on November 20, 2003.

Election/Restrictions

1. Applicant's election with traverse of Claims 18-22 and 24-32 in Paper No. November 20, 2003, is acknowledged. The traversal is on the ground(s) that a membrane cannot be formed without utilizing a sacrificial layer between the first micromachined layer and the second micromachined layer. This is not found persuasive because Applicant relies on an element not recited within Claim 33 (i.e. – a sacrificial layer). The scope of Claim 33 merely encompasses a first layer forming a membrane and a second layer directly adjacent with at least one cut therein. To form a device within the scope of Claim 33, one need not form a sacrificial layer (an element not recited in Claim 33) between first and second layers. Additionally, the Examiner notes that there could be a void beneath the first layer, thereby, creating a membrane of the first layer. Finally, the Examiner notes that Claims 1 and 18 have acquired a separate status within the art from Claims 16 and 33, by their different classification, and consequently, restriction for examination purposes is proper.

Additionally, the Applicant traverses on the ground(s) that point defects, dislocations or gross defects cannot be used to control the strength gradient within a layer of a membrane for a micro-device. This is not found persuasive because Applicant relies on elements not recited within the body of Claim 16 (i.e. – a membrane for a micro-device). The limitation of a membrane for a micro-device is in the preamble,

and as the body of the claim makes no reference or allusion to a membrane for a micro-device, it is not accorded any patentable weight. Accordingly, the scope of Claim 16 merely encompasses a layer with upper and lower portions with approximately similar first and second strength gradients. As such, the method proposed by the Examiner could produce such a layer. Finally, the Examiner notes that Claims 1 and 18 have acquired a separate status within the art from Claims 16 and 33, by their different classification, and consequently, restriction for examination purposes is proper.

The requirement is still deemed proper and is therefore made FINAL.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on November 7, 2001, has been considered and placed in the record of file.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 25-27 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Removing the second layer of second material prior to removing the protective layer is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The Examiner is uncertain how the protective layer may be removed without removing the second layer of second material first because the specification provides no disclosure.

5. Claims 26 and 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification fails to teach removing the protective layer by mechanical or chemical means.

6. Claims 29 and 31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification fails to teach forming the protective layer of polysilicon or single crystal silicon.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 25-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 25 depends form a cancelled claim, and as such, the scope of the claim cannot be ascertained. The Examiner assumes Claim 25 depends from Claim 24. See MPEP § 608.01(n)

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 18, 19 and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by 4,740,410 to Muller et al.

In reference to Claims 18 and 19, Muller et al. teaches:

- forming a first layer of a first material (24 or 25) (See Figures 3-8 and columns 4-5 lines 13-55);
- forming a first layer of polysilicon structural material (26) over the first layer of the first material (See Figures 3-8 and columns 4-5 lines 13-55);
- forming at least one cut (27) in the first layer of structural material (See Figures 3-8 and columns 4-5 lines 13-55);
- forming a first layer of a sacrificial material (28), less resistant to removal than the first material, over the first layer of structural material such that an interface (i.e. – the sidewall of first material (25) interfaces sacrificial material (28)) is created between the first material and the sacrificial material at the at least one cut in the first layer of structural material (See Figures 3-8 and columns 4-5 lines 13-55);
- forming a second layer of structural material (30) over the first laver of sacrificial material (See Figures 3-8 and columns 4-5 lines 13-55); and
- subjecting the first layer of sacrificial material to a release etch to remove the

first layer of the sacrificial material (See Figures 3-8 and columns 4-5 lines 13-55)

The Examiner has not given patentable weight to the preamble limitation of "a membrane of a structural material for a micro-device" because "[A] claim preamble has the import that the claim as a whole suggests for it". *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995) "If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give, life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999). As the body of the claim makes no reference, nor allusion, to a membrane of a structural material for a micro-device (i.e. - the preamble does not recite limitations of the claim), and since the above referenced preamble limitation does not give life or meaning to the claim, it is deemed to be of no patentable weight. See MPEP § 2111.02

In reference to Claim 21, Muller et al. teaches:

- wherein the at least one cut in the first layer of structural material comprises forming at least one channel (27) (See Figures 3-8 and columns 4-5 lines 13-55)

The Examiner notes that Merriam Webster's Collegiate Dictionary (2001), Tenth Edition, defines channel as a "conduit". As the cut in structural layer (26) provides a conduit between layers, it acts as channel.

In reference to Claim 22, Muller et al. teaches:

- forming the first layer of the first material (24) comprises forming a first layer of nitride (See Figures 3-8 and columns 4-5 lines 13-55); and
- forming the first layer of the sacrificial material comprises forming a first layer of oxide

The Examiner notes that layer 24, comprised by silicon nitride, acts as the first layer of the first material.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over 4,740,410 to Muller et al. in view of US 2003/0071015 to Chinn et al.

Incorporating all arguments of Claim 18 and noting that Muller et al. fails to explicitly teach wherein forming the first layer of structural material comprises forming a layer of single crystal silicon.

However, Chinn et al., on page 2 paragraph [0036], teaches that structural layers can be comprised by crystalline silicon.

It would have been obvious to one of ordinary skill in the art to modify Muller et al. by incorporating a structural material comprised by crystalline silicon, as taught by Chinn et al., to form a micro-electro-mechanical device that does not display stiction.

Furthermore, the specification contains no disclosure of either the critical nature of the claimed process or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen limitations or upon another variable recited in a claim, the Applicant must show that the chosen limitations are critical. *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990)

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. Claim 18 is rejected under 35 U.S.C. 102(e) as being anticipated by US 2003/0152815 to LaFollette et al.

In reference to Claim 18, LaFollette et al. teaches:

- forming a first layer of a first material (30) (See Figures 1 and 2 and paragraphs [0164] to [0171]);
- forming a first layer of structural material (34 and 34') over the first layer of the first material (See Figures 1 and 2 and paragraphs [0164] to [0171]);
- forming at least one cut (i.e. – the photoresist patterns the first microscopic electrode) in the first layer of structural material (See Figures 1 and 2 and paragraphs [0164] to [0171]);
- forming a first layer of a sacrificial material (38), less resistant to removal than the first material, over the first layer of structural material such that an interface is created between the first material and the sacrificial material at the at least one cut in the first layer of structural material (See Figures 1 and 2 and paragraphs [0164] to [0171]);
- forming a second layer of structural material (40) over the first laver of sacrificial material (See Figures 1 and 2 and paragraphs [0164] to [0171]); and
- subjecting the first layer of sacrificial material (38) to a release etch (38') to remove the first layer of the sacrificial material (See Figures 1 and 2 and paragraphs [0164] to [0171])

The Examiner has not given patentable weight to the preamble limitation of "a membrane of a structural material for a micro-device" because "[A] claim preamble has the import that the claim as a whole suggests for it". *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995) "If the claim preamble, when read in the context of the entire claim, recites limitations of the claim,

or, if the claim preamble is 'necessary to give, life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999). As the body of the claim makes no reference, nor allusion, to a membrane of a structural material for a micro-device (i.e. - the preamble does not recite limitations of the claim), and since the above referenced preamble limitation does not give life or meaning to the claim, it is deemed to be of no patentable weight. See MPEP § 2111.02

15. Claims 18, 24, 28 and 29 are rejected under 35 U.S.C. 102(e) as being anticipated by 6,587,613 to De Natale.

In reference to Claim 18, De Natale teaches:

- forming a first layer of a first material (60a) (See Figure 4 and columns 6-8 lines 50-45);
- forming a first layer of polysilicon structural material (element 62 within layer60b) over the first layer of the first material (See Figure 4 and columns 6-8 lines 50-45);
- forming at least one cut (i.e. – the areas within layer 60b not containing polysilicon) in the first layer of structural material (See Figure 4 and columns 6-8 lines 50-45);
- forming a first layer of a sacrificial material (element 64 within layers 60b and 60c), less resistant to removal than the first material, over the first layer of

structural material such that an interface is created between the first material and the sacrificial material at the at least one cut in the first layer of structural material (See Figure 4 and columns 6-8 lines 50-45);

- forming a second layer of structural material (elements 62 and 66 within layers 60c and 60d) over the first laver of sacrificial material (See Figure 4 and columns 6-8 lines 50-45); and
- subjecting the first layer of sacrificial material (element 64 within layers 60b and 60c) to a release etch to remove the first layer of the sacrificial material (See Figure 4 and columns 6-8 lines 50-45)

The Examiner has not given patentable weight to the preamble limitation of "a membrane of a structural material for a micro-device" because "[A] claim preamble has the import that the claim as a whole suggests for it". *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995) "If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give, life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999). As the body of the claim makes no reference, nor allusion, to a membrane of a structural material for a micro-device (i.e. - the preamble does not recite limitations of the claim), and since the above referenced preamble limitation does not give life or meaning to the claim, it is deemed to be of no patentable weight. See MPEP § 2111.02

In reference to Claims 24, 28 and 29, De Natale teaches:

- forming a second layer of sacrificial material (element 64 within layer 60d) over the second layer of structural material (i.e. - element 62 within layer 60c) (See Figures 4-9 and columns 6-8 lines 50-45);
- forming a polysilicon protective layer (layer 70 adjacent to layer 60d) over the second layer of the sacrificial material (See Figures 4-9 and columns 6-8 lines 50-45);
- forming at least on cut in the protective layer (i.e. – noting the oxide filled areas that traverse layer 70 from its top surface to layer 60d) (See Figures 4-9 and columns 6-8 lines 50-45);
- forming a second layer of a second material (the oxide portion of layer 70) over the protective layer such that an interface is created between the second layer of the second material and the second layer of sacrificial material at the at least on cut in the protective layer (See Figures 4-9 and columns 6-8 lines 50-45); and
- subjecting the second layer of the sacrificial material to the release etch to remove the second layer of the sacrificial material (See Figures 4-9 and columns 6-8 lines 50-45)

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

> the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claims 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over 6,587,613 to De Natale in view of US 2003/0071015 to Chinn et al.

Incorporating all arguments of Claims 18 and 24 and noting that De Natale fails to explicitly teach wherein forming the first layer of structural material comprises forming a layer of single crystal silicon.

However, Chinn et al., on page 2 paragraph [0036], teaches that structural layers can be comprised by crystalline silicon.

It would have been obvious to one of ordinary skill in the art to modify De Natale by incorporating a structural material comprised by crystalline silicon, as taught by Chinn et al., to form a micro-electro-mechanical device that does not display stiction.

Furthermore, the specification contains no disclosure of either the critical nature of the claimed process or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen limitations or upon another variable recited in a claim, the Applicant must show that the chosen limitations are critical. *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990)

Allowable Subject Matter

18. Claims 25-27 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

19. The following is a statement of reasons for the indication of allowable subject matter.

With regards to Claims 25-27, the prior art fails to teach, in combination with other claimed features, removing the protective layer after subjecting the first and second layer of sacrificial material to a release etch.

With regards to Claim 32, the prior art fails to teach, in combination with other claimed features, forming the first layer of first material and the second layer of second material from a layer of nitride.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Hogans whose telephone number is (703) 305-3361 or (571) 272-1691, after February 9, 2004. The examiner can normally be reached on M-F (7:30-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (703) 308-4940. The fax phone

number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

dh

CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

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INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

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109180	New US Patent Application

APPLICANT(S): Peter M. GULVIN, Elliott A. EKLUND, Joel A. KUBBY

FILING DATE: November 7, 2001

JC878 U.S. PTO 10/006107 11/07/01

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS
DM		09/723,243 Atty Dckt: 106460	11/28/2000	GOORAY et al.		
		5,501,893	03/26/1996	LAERMER et al.		
		5,783,340	07/21/1998	FARINO et al.		
		5,798,283	08/25/1998	MONTAGUE et al.		
		5,804,084	09/08/1998	NASBY et al.		
		5,919,548	07/06/1999	BARRON et al.		
		5,963,788	10/05/1999	BARRON et al.		
		6,053,208	04/25/2000	ONISHI et al.		
DM		6,127,198	10/03/2000	COLEMAN et al.		

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

EXAMINER: DM — DATE CONSIDERED: 12-19-03

Examiner: Initial if citation considered, whether or not citation is in conformance with M.P.E.P. 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

OIPE JC17
JAN 15 2004
PATENT & TRADEMARK OFFICE

Notice of References Cited

Application/Control No.	Applicant(s)/Patent Under Reexamination	
09/986,107	GULVIN ET AL.	
Examiner	Art Unit	Page 1 of 1
David L. Hogans	2813	

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
	A	US-4,740,410	04-1988	Muller et al.	428/133
	B	US-2003/0071015	04-2003	Chinn et al.	216/36
	C	US-2003/0152815	08-2003	LaFollette et al.	429/7
	D	US-6,587,613	07-2003	De Natale, Jeffrey F.	385/18
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

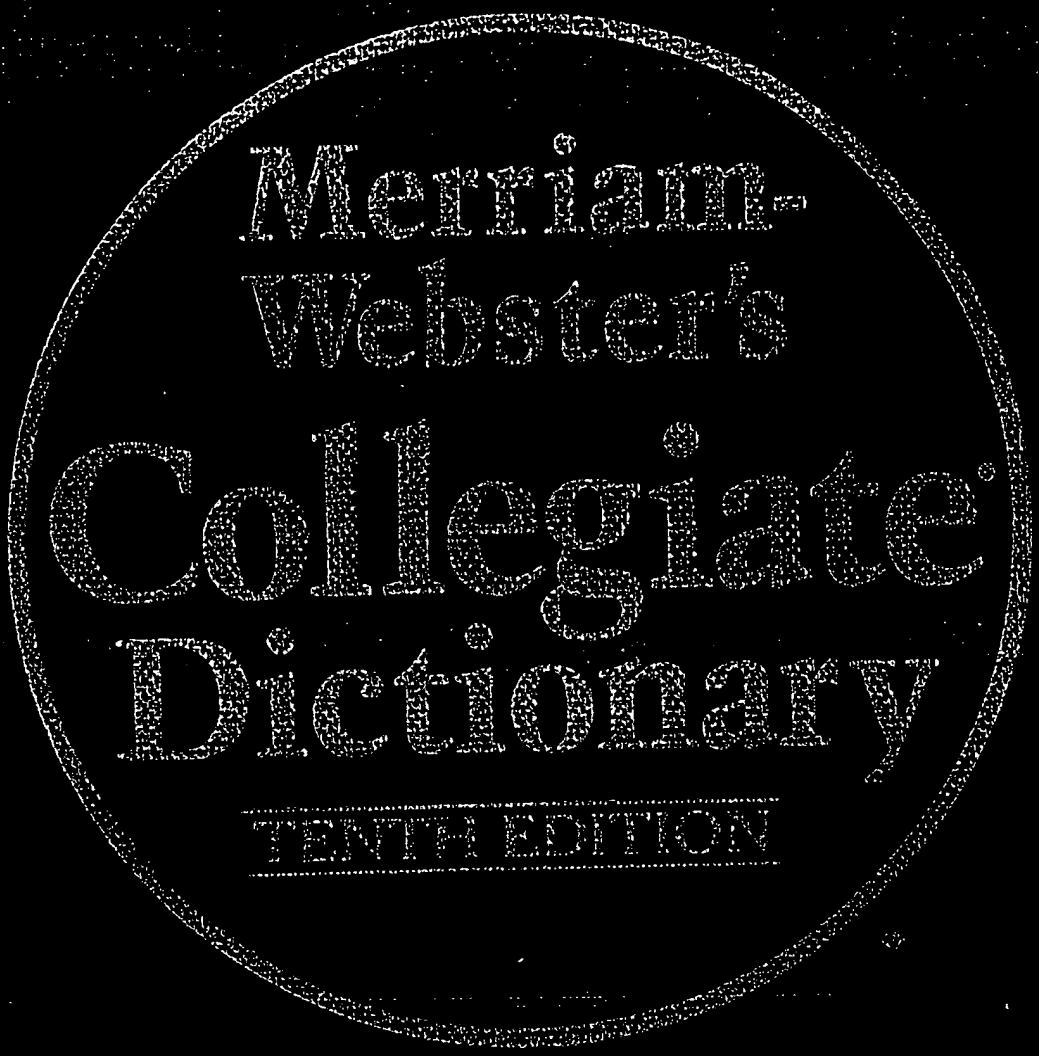
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	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Merriam Webster's Collegiate Dictionary (2001), Merriam Webster Inc., Tenth Edition, page 190
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



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patience of delay or restraint — usu. used in the phrase *champing at the bit* ⟨he was ~*ing* at the bit to begin⟩

²champ \'champ\ *n* (1868) : CHAMPION

cham·pac *or* **cham·pak** \'cham-ˌpak, 'chəm-(ˌ)pək\ *n* [Hindi & Skt; Hindi *campak*, fr. Skt *campaka*] (ca. 1770) : an Asian tree (*Michelia champaca*) of the magnolia family with yellow flowers

cham·pagne \sham-'pān\ *n* [F, fr. *Champagne*, France] (1664) **1** : a white sparkling wine made in the old province of Champagne, France; *also* : a similar wine made elsewhere **2** : a pale orange yellow to light grayish yellowish brown

cham·paign \sham-'pān\ *n* [ME *champaine*, fr. MF *champagne*, fr. LL *campania* — more at CAMPAIGN] (15c) **1** : an expanse of level open country : PLAIN **2** *archaic* : BATTLEFIELD — **champaign** *adj*

cham·pers \'sham-pərz\ *n pl but sing in constr* [by alter.] (1955) *Brit* : CHAMPAGNE 1

cham·per·ty \'cham-pər-tē\ *n* [ME *champartie*, fr. MF *champart* field rent, fr. *champ* field (fr. L *campus*) + *part* portion — more at PART] (15c) : a proceeding by which a person not a party in a suit bargains to aid in or carry on its prosecution or defense in consideration of a share of the matter in suit — **cham·per·tous** \-pər-təs\ *adj*

cham·pi·gnon \(ˌ)sham-pē-'nyōn, (ˌ)shām-, -'nyō̃; sham-'pin-yən, cham-\ *n* [F, fr. MF, alter. of *champigneul*, ultim. fr. LL *campania*] (1670) : an edible fungus; *esp* : MEADOW MUSHROOM

¹cham·pi·on \'cham-pē-ən\ *n* [ME, fr. OF, fr. ML *campion-*, *campio*, of WGmc origin; akin to OE *cempa* warrior] (13c) **1** : WARRIOR, FIGHTER **2** : a militant advocate or defender ⟨a ~ of civil rights⟩ **3** : one that does battle for another's rights or honor ⟨God will raise me up a ~ —Sir Walter Scott⟩ **4** : a winner of first prize or first place in competition; *also* : one who shows marked superiority ⟨a ~ at selling⟩

²champion *vt* (1605) **1** *archaic* : CHALLENGE, DEFY **2** : to protect or fight for as a champion **3** : to act as militant supporter of : UPHOLD, ADVOCATE ⟨always ~*s* the cause of the underdog⟩ *syn* see SUPPORT

cham·pi·on·ship \-ˌship\ *n* (1825) **1** : designation as champion **2** : the act of championing : DEFENSE ⟨his ~ of freedom of speech⟩ **3** : a contest held to determine a champion

champ·le·vé \ˌshäⁿ-lə-'vā\ *adj* [F] (1856) : of, relating to, or being a style of enamel decoration in which the enamel is applied and fired in cells depressed (as by incising) into a metal background — compare CLOISONNÉ — **champlevé** *n*

¹chance \'chan(t)s\ *n* [ME, fr. OF, fr. (assumed) VL *cadentia* fall, fr. L *cadent-*, *cadens*, prp. of *cadere* to fall; perh. akin to Skt *śad-* to fall off] (14c) **1 a** : something that happens unpredictably without discernible human intention or observable cause **b** : the assumed impersonal purposeless determiner of unaccountable happenings : LUCK **c** : the fortuitous or incalculable element in existence : CONTINGENCY **2** : a situation favoring some purpose : OPPORTUNITY ⟨needed a ~ to relax⟩ **3** : a fielding opportunity in baseball **4 a** : the possibility of a particular outcome in an uncertain situation; *also* : the degree of likelihood of such an outcome ⟨a small ~ of success⟩ **b** *pl* : the more likely indications ⟨~*s* are he's already gone⟩ **5 a** : RISK ⟨not taking any ~*s*⟩ **b** : a raffle ticket — **chance** *adj* — **by chance** : in the haphazard course of events ⟨they met *by chance*⟩

²chance *vb* **chanced; chanc·ing** *vi* (14c) **1 a** : to take place or come about by chance : HAPPEN **b** : to be found by chance **c** : to have the good or bad luck ⟨we *chanced* to meet⟩ **2** : to come or light by chance ~ *vt* **1** : to leave the outcome of to chance **2** : to accept the hazard of : RISK — **chance one's arm** *Brit* : to take a risk

chance·ful \'chan(t)s-fəl\ *adj* (1594) **1** *archaic* : CASUAL **2** : EVENTFUL

chan·cel \'chan(t)-səl\ *n* [ME, fr. MF, fr. LL *cancellus* lattice, fr. L *cancelli*; fr. the latticework enclosing it — more at CANCEL] (14c) : the part of a church containing the altar and seats for the clergy and choir

chan·cel·lery *or* **chan·cel·lory** \'chan(t)-s(ə-)lə-rē, -səl-rē\ *n, pl* **-ler·ies** *or* **-lor·ies** (14c) **1 a** : the position, court, or department of a chancellor **b** : the building or room where a chancellor has his office **2** : the office of secretary of the court of a person high in authority **3** : the office or staff of an embassy or consulate

chan·cel·lor \'chan(t)-s(ə-)lər\ *n* [ME *chanceler*, fr. OF *chancelier*, fr. LL *cancellarius* doorkeeper, secretary, fr. *cancellus*] (14c) **1 a** : the secretary of a nobleman, prince, or king **b** : the lord chancellor of Great Britain **c** *Brit* : the chief secretary of an embassy **d** : a Roman Catholic priest heading the office in which diocesan business is transacted and recorded **2 a** : the titular head of a British university **b** (1) : a university president (2) : the chief executive officer in some state systems of higher education **3 a** : a lay legal officer or adviser of an Anglican diocese **b** : a judge in a court of chancery or equity in various states of the U.S. **4** : the chief minister of state in some European countries — **chan·cel·lor·ship** \-ˌship\ *n*

chancellor of the exchequer *often cap C&E* (1672) : a member of the British cabinet in charge of the public income and expenditure

chance–med·ley \'chan(t)s-'med-lē\ *n* [AF *chance medlée* mingled chance] (15c) **1** : accidental homicide not entirely without fault of the killer but without evil intent **2** : haphazard action : CONFUSION

chan·cery \'chan(t)-sə-rē, 'chan(t)s-rē\ *n, pl* **-cer·ies** [ME *chancerie*, alter. of *chancellerie* chancellery, fr. OF, fr. *chancelier*] (1553) **1 a** *cap* : a high court of equity in England and Wales with common-law functions and jurisdiction over causes in equity **b** : a court of equity in the American judicial system **c** : the principles and practice of judicial equity **2** : a record office for public archives or those of ecclesiastical, legal, or diplomatic proceedings **3 a** : a chancellor's court or office or the building in which it is located **b** : the office in which the business of a Roman Catholic diocese is transacted and recorded **c** : the office of an embassy : CHANCELLERY 3 — **in chancery** **1** : in litigation in a court of chancery; *also* : under the superintendence of the lord chancellor ⟨a ward *in chancery*⟩ **2** : in a hopeless predicament

chan·cre \'shaŋ-kər\ *n* [F, fr. L *cancer*] (ca. 1605) : a primary sore or ulcer at the site of entry of a pathogen (as in tularemia); *esp* : the initial lesion of syphilis — **chan·crous** \-k(ə-)rəs\ *adj*

chan·croid \'shaŋ-ˌkrȯid\ *n* (1861) : a venereal disease caused by a hemophilic bacterium (*Hemophilus ducreyi*) and characterized by chancres unlike those of syphilis in lacking firm indurated margins — called also *soft chancre* — **chan·croi·dal** \shaŋ-'krȯi-dᵊl\ *adj*

chancy \'chan(t)-sē\ *adj* **chanc·i·er; -est** (1513) **1** *Scot* : bringing good luck : AUSPICIOUS **2** : uncertain in outcome or prospect : RISKY **3** : occurring by chance : HAPHAZARD — **chanc·i·ness** *n*

chan·de·lier \ˌshan-də-'lir\ *n* [F, lit., candlestick, modif. of L *candelabrum*] (1736) : a branched often ornate lighting fixture suspended from a ceiling — **chan·de·liered** \-'lird\ *adj*

chan·delle \shan-'del, shäⁿ-\ *n* [F, lit., candle] (1918) : an abrupt climbing turn of an airplane in which the momentum of the plane is used to attain a higher rate of climb — **chandelle** *vi*

chan·dler \'chan(d)-lər\ *n* [ME *chandeler*, fr. MF *chandelier*, fr. OF, fr. *chandelle* candle, fr. L *candela*] (14c) **1** : a maker or seller of tallow or wax candles and usu. soap **2** : a retail dealer in provisions and supplies or equipment of a specified kind ⟨a yacht ~⟩

chan·dlery \-lə-rē\ *n, pl* **-dler·ies** (15c) **1** : a place where candles are kept **2** : the business of a chandler **3** : the commodities sold by a chandler

¹change \'chānj\ *vb* **changed; chang·ing** [ME, fr. OF *changier*, fr. L *cambiare* to exchange, prob. of Celt origin; akin to OIr *camm* crooked] *vt* (13c) **1 a** : to make different in some particular : ALTER ⟨never bothered to ~ the will⟩ **b** : to make radically different : TRANSFORM ⟨can't ~ human nature⟩ **c** : to give a different position, course, or direction to **2 a** : to replace with another ⟨let's ~ the subject⟩ **b** : to make a shift from one to another : SWITCH ⟨always ~*s* sides in an argument⟩ **c** : to exchange for an equivalent sum or comparable item **d** : to undergo a modification of ⟨foliage *changing* color⟩ **e** : to put fresh clothes or covering on ⟨~ a bed⟩ ~ *vi* **1** : to become different ⟨her mood ~*s* every hour⟩ **2** *of the moon* : to pass from one phase to another **3** : to shift one's means of conveyance : TRANSFER ⟨on the bus trip he had to ~ twice⟩ **4** *of the voice* : to shift to lower register : BREAK **5** : to undergo transformation, transition, or substitution ⟨winter *changed* to spring⟩ **6** : to put on different clothes **7** : EXCHANGE, SWITCH ⟨neither liked his seat so they *changed* with each other⟩ — **chang·er** *n* — **change hands** : to pass from the possession of one owner to that of another ⟨money *changes hands* many times⟩

syn CHANGE, ALTER, VARY, MODIFY mean to make or become different. CHANGE implies making either an essential difference often amounting to a loss of original identity or a substitution of one thing for another ⟨*changed* the shirt for a larger size⟩. ALTER implies a difference in some particular respect without suggesting loss of identity ⟨slightly *altered* the original design⟩. VARY stresses a breaking away from sameness, duplication, or exact repetition ⟨*vary* your daily routine⟩. MODIFY suggests a difference that limits, restricts, or adapts to a new purpose ⟨*modified* the building for use by the handicapped⟩.

²change *n* (13c) **1** : the act, process, or result of changing: as **a** : ALTERATION ⟨a ~ in the weather⟩ **b** : TRANSFORMATION ⟨a time of vast social ~⟩ ⟨going through ~*s*⟩ **c** : SUBSTITUTION ⟨a ~ of scenery⟩ **d** : the passage of the moon from one monthly revolution to another; *also* : the passage of the moon from one phase to another **2** : a fresh set of clothes **3** *Brit* : EXCHANGE 5a **4 a** : money in small denominations received in exchange for an equivalent sum in larger denominations **b** : money returned when a payment exceeds the amount due **c** : coins esp. of low denominations ⟨a pocketful of ~⟩ **d** : a negligible additional amount ⟨only six minutes and ~ left in the game⟩ **5** : an order in which a set of bells is struck in change ringing **6** : CHANGE-UP

change·able \'chān-jə-bəl\ *adj* (13c) : capable of change: as **a** : able or apt to vary ⟨~ weather⟩ **b** : subject to change : ALTERABLE **c** : FICKLE **d** : IRIDESCENT — **change·abil·i·ty** \ˌchān-jə-'bi-lə-tē\ *n* — **change·able·ness** \'chān-jə-bəl-nəs\ *n* — **change·ably** \-blē\ *adv*

change·ful \'chānj-fəl\ *adj* (1591) : notably variable : UNCERTAIN — **change·ful·ly** \-fə-lē\ *adv* — **change·ful·ness** *n*

change·less \'chānj-ləs\ *adj* (1580) : marked by the absence of change : CONSTANT — **change·less·ly** *adv* — **change·less·ness** *n*

change·ling \'chānj-liŋ\ *n* (1537) **1** *archaic* : TURNCOAT **2** : a child secretly exchanged for another in infancy **3** *archaic* : IMBECILE — **changeling** *adj*

change off *vi* (1873) **1** : to alternate with another at doing an act **2** : to alternate between two different acts or instruments or between an action and a rest period

change of heart (ca. 1828) : a reversal in position or attitude

change of life (1834) : ²CLIMACTERIC 2

change of pace (1912) **1** : CHANGE-UP **2** : an interruption of continuity by a shift to a different activity

change·over \'chān-ˌjō-vər\ *n* (1907) **1** : CONVERSION, TRANSITION **2** : a pause in a tennis match during which the players change sides of the court

change ringing *n* (1872) : the art or practice of ringing a set of tuned bells (as in the bell tower of a church) in continually varying order

change–up \'chān-ˌjəp\ *n* (1949) : a slow pitch in baseball thrown with the same motion as a fastball in order to deceive the batter

¹chan·nel \'cha-nᵊl\ *n* [ME *chanel*, fr. MF, fr. L *canalis* channel — more at CANAL] (14c) **1 a** : the bed where a natural stream of water runs **b** : the deeper part of a river, harbor, or strait **c** : a strait or narrow sea between two close landmasses **d** : a means of communication or expression: as (1) : a path along which information (as data or music) in the form of an electrical signal passes (2) *pl* : a fixed or official course of communication ⟨went through established military ~*s* with his grievances⟩ **e** : a way, course, or direction of thought or action ⟨new ~*s* of exploration⟩ **f** : a band of frequencies of sufficient width for a single radio or television communication **g** : CHANNELER **2 a** : a usu. tubular enclosed passage : CONDUIT **b** : a passage created in a selectively permeable membrane by a conformational change in membrane proteins **3** : a long gutter, groove, or furrow **4** : a metal bar of flattened U-shaped section

²channel *vt* **-neled** *or* **-nelled; -nel·ing** *or* **-nel·ling** (15c) **1 a** : to form, cut, or wear a channel in **b** : to make a groove in ⟨~ a chair leg⟩ **2** : to convey or direct into or through a channel ⟨~ his energy into constructive activities⟩ **3** : to serve as a channeler or intermediary for

³channel *n* [alter. of *chainwale*, fr. ¹*chain* + ¹*wale*] (1769) : one of the flat ledges of heavy plank or metal bolted edgewise to the outside of a ship to increase the spread of the shrouds

channel bass *n* (1887) : a large coppery drum (*Sciaenops ocellatus*) chiefly of the Atlantic coast of No. America that has a black spot at the base of the tail and is an important game and food fish — called also *red drum, redfish*